Book Reviews

The Dynamics of Supply: Estimation of Farmers' Response to Price. By Marc Nerlove. Johns Hopkins Press, Baltimore, Md. 267 pages. 1958. $5 in hard bound edition, $4 in paper bound.

IN HIS PREFACE, the author points out that when "the solution of the original problem is not as acceptable as on first thought . . . it is difficult to know how and when to commend one's work to the mercies of public discussion. Nonetheless, the benefits of such discussion far outweigh any disadvantages which may accrue to the author." This commendable statement about the value of discussion in handling difficult problems provides the viewpoint for this review article in which I shall attempt to place Nerlove's substantial effort in perspective. In doing this, Nerlove's effort is often criticized for shortcomings that are also characteristic of the profession's work. This, in turn, makes it important to say at the outset that Nerlove has done a piece of work that should find an important place in the development of methodologies and theory for measuring and studying supply responses.

The first two chapters provide the theoretical underpinning. Chapter 3 presents a quite limited review of previous empirical work on the supply of agricultural commodities. Data limitations are discussed in chapter 4, while the characteristics of the corn, cotton, and wheat sectors of the agricultural economy are discussed in the next three chapters, the last of which deals very briefly with Government programs for the same three crops. The results of the statistical analysis are presented in chapters 8 and 9.

This review encompasses three topics: (1) Theoretical considerations, (2) results obtained, and (3) the place of Nerlove's effort in the literature and work on the supply of agricultural commodities.

Theoretical Considerations

In his empirical work, Nerlove emphasizes heavily the use of observable variables (recorded prices and quantities) to estimate relationships among nonobservable variables, namely, "expected normal prices" and "long-run equilibrium output." This emphasis makes it necessary for his theory to cover (1) dynamics as well as statics and (2) what I call the "length of run problem" in eco-

nomics. As he draws heavily on Hicks, Walras and Marshall, he inherits several intellectual difficulties from the profession's past. Ironically, these difficulties seem to this reviewer to be in the areas to which Nerlove has attempted to make his special contribution, namely (1) dynamics and expectations and (2) determination of relevant lengths of run.

He uses the concepts of "elasticity" and "coefficient" of expectation in dealing with actual and normal expected prices. In dealing with actual and long-run equilibrium output, he uses the corresponding concepts of "elasticity" and "coefficient" of adjustment.

Elasticity and coefficients of price expectation.—Nerlove uses a simple statistical model to explain price expectation. Basically, his model regards this year's expected normal price as last year's expected normal price plus some proportion, β, where $0 < \beta \leq 1$, of the difference between last year's actual and last year's expected normal price. As last year's price is regarded to be a similar function of the same variables for the next previous year, the model makes current expected prices a function of the average of all past prices, the most recent prices receiving the largest weight according to the size of β which is the coefficient of price expectation. When $\beta = 1$, this year's expected normal price is last year's actual price, while if $\beta = 0$, this year's expected price is the same as last year's expected normal price. The first of these special extreme cases has been used often by past investigators. Nerlove assumes neither extreme, but investigates the theoretical aspects of the problem of estimating β.

Elasticity and coefficients of adjustments.—The adjustment concepts used are analogous to and as simple as the price elasticity and coefficient of expectation concepts. This year's output is regarded as last year's actual output plus a proportion γ, where $0 < \gamma \leq 1$, of the difference between last year's actual output and its long-run equilibrium output. The treatment of γ is similar to the treatment of β.

Output as a function of price.—In strict accordance with the static production economic theory developed by Hicks, Walras, Marshall and others, long-run equilibrium output is treated by Nerlove as a function of normal expected price.

A major difficulty recognized by Nerlove is that his theoretical system does not permit him to distinguish estimates of β, (the coefficient of price expectation) from estimates of γ (the production adjustment coefficient). He attempts to handle this *identification* problem with an additional "identifying" variable.

Some empirical observations on the formulation of price expectations and adjustments thereto.— Work on expectations carried out by the risk and uncertainty subcommittee of the North Central Farm Management Committee (NCFMRC) indicates that the price expectation models used by farmers are much more sophisticated than the simple statistical models used by Nerlove or those previously postulated and investigated at Iowa by Schultz, Gaines and Heady; or at Illinois by Williams. Farmers have had years of experience with government programs which controlled prices and production. They have also experienced the shifts in demand which accompanied World Wars I and II and the Korean conflict. Inflations and deflations have been weathered. These experiences have been supplemented by the interpretative, educational efforts of the Extension Service and the agricultural press. The overall result is that the price expectation models of farmers are conceptually more complex than the simple primarily statistical models envisioned by Nerlove and the workers mentioned above.[1] Do we really believe that the next year's expected price is this year's expected price plus some proportion (constant from year to year) of the difference between last year's actual and last year's expected normal price regardless of wars, price-support activities, inflations, economic collapse, changing foreign demand, strikes, and institutional adjustments—all of which were important in the 1909–32 period studied by Nerlove?

Similar work on farmers' responses to price changes and the formulation of their production plans indicates far more complex adjustments than can be handled by a simple γ which does not change from year to year.[2]

Static production economic theory, lengths of run and fixed assets.—The survey work of NCFMRC is supplemented by theoretical work on the consequences of observed widespread differences between acquisition and salvage prices for producer durables. These theoretical efforts indicate major difficulties in the Marshallian, Walrasian, and Hicksian production adjustment and supply concepts used by Nerlove.

The difficulties and, hence, the need for a more adequate theory of fixed assets are outlined in the following discussion. Nerlove writes, (p. 29) "If a firm in a competitive industry produces only one output, it can be shown that the firm's supply curve for that output is identical with its marginal cost curve when marginal cost is above average variable cost, and identical with the average variable cost when marginal cost is below average variable cost." Do we really believe this standard teaching of sophomore texts? Consider a short run in which a dairy farmer regards feed and associated inputs as variable while cows, barns, and milking equipment are fixed. Do we really believe that the price of milk can fall until the present value of the anticipated future MVP's of the annual services of a dairy cow fall to zero, as would be true when MC=AVC? Of course not. We know that the meat market stands ready to buy the cow long before the capitalized value of her anticipated future MVP's falls to zero. And if our farmer starts to sell cows, it is obvious that neither his former MC nor his AVC curve is any longer relevant.

Conversely, if the price of milk were to rise until the present value of the future stream of MVP's anticipated from a dairy cow exceeded her acquisition price (market value plus buying and transportation costs), that part of the original MC above AVC would not be the firm's supply curve. Again, our farmer would treat dairy cows as variable and would move to a marginal cost

[1] Partenheimer, Earl J., *Some Expectation Models Used by Selected Groups of Midwestern Farmers.* Unpublished Ph. D. Thesis, Department of Agricultural Economics, Michigan State University, 1958. (Abstract available on request.)

[2] Boyne, D. H. and Johnson, G. L., A Partial Evaluation of Static Theory from Results of the Interstate Managerial Survey, Jour. Farm Econ., Vol. 40, May 1958.

curve which includes the cost of acquiring the services of more dairy cows. As the costs of acquiring such services exceed what can be realized in disposing of such services by selling cows, the MC curve for expanding production by adding cows is different from the MC curve for contracting production by selling cows.

A theory is needed which determines endogenously which inputs enter (along with their prices) into MC and AVC, and which enter into AFC. Such a theory would produce a partially irreversible supply function. Initial decreases in product prices following a rise in production would have little effect on output, while still larger decreases would be expected to yield a much more elastic response. Such a contraction, if followed by a price increase, would not be expected to induce an immediate expansion. However, further price increases would eventually be expected to bring forth more elastic responses.

Further difficulties appear on page 35. Here we find: "Normally factors of production will have rising supply curves to the industry . . . but will appear perfectly elastic to the individual firm." For the farm firm, the acquisition price of a durable (or of the services obtained by buying the durable) is greater than the salvage value of that durable (or the services of that durable marketed by selling it). The same is true of many expendables. Consider for instance the buying and/or transportation charges involved in acquiring and disposing of land, buildings, tiling systems, combines, cotton gins, corn cribs, hay, grain elevators, silage, tractors and fuel, all of which are involved in the production of corn, cotton, or wheat. Every farm boy knows that selling such assets or the services they produce is quite a different matter from buying them. Discontinuities are far more characteristic than perfect elasticities.

In view of the above discussion of output adjustment and supply functions for factors of production, Nerlove's coefficient of adjustment, γ, seems somewhat inadequate. A boy appears to have been sent to do a man's job. Do we really expect the difference between next year's production and this year's production to be some proportion γ, where $0 < \gamma \leq 1$, of the difference between this year's "long run equilibrium output" and this year's actual output regardless of whether product prices have just reversed, have been going up

for a number of years or have been going down for a number of years? [3]

The above brief and inadequate account of what is known and suspected about the formation of price expectations and production adjustments strongly indicates that Nerlove's β and γ are oversimplifications.

Results Obtained

When Nerlove used distributed lags to estimate γ and/or β for corn, wheat and cotton, higher estimates were obtained than when one preceding year's price is treated as the long-run normal price as has usually been done in the past. These coefficients yielded, in turn, greater elasticities of production with respect to price. He points out that these larger elasticities are consistent with experiences under governmental controls and with the findings of micro-agricultural economic analysis. The estimates obtained can be interpreted as either β, the coefficient of price expectations, or as γ, the coefficient of production adjustment. Attempts to produce separate estimates of β and γ using an "identifying variable" were unsuccessful. Either the variables selected to obtain identification, or the β and γ were inappropriate.

In the first section of this review-article, questions were raised about the applicability of the price-expectation and production-adjustment models employed by Nerlove. The reasonableness of the elasticities he obtained do not detract from the relevance of these questions. Normal expected prices as estimated in regression I are averages. As such, they have the same mean as the original prices but have a much smaller range of variation. When the regression of acreage on a series of moving averages is compared with the regression of the same variable on the individual observations in the series, we expect a greater regression in the first than in the second *regardless of validity of the reasons for using the average.* The fact, then, that higher coefficients were obtained by Nerlove does not necessarily make the case for the *logic* by which they were obtained.

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[3] For some initial work on this problem see Clark Edwards, *Resource Fixity, Credit Availability and Agricultural Organization,* unpublished Ph.D. Thesis, Michigan State University, 1958. (Copies of abstract available upon request.)

Other empirical work on price expectations and production adjustment on the part of farmers, supplemented by far more dynamic theoretical work on price expectations and more realistic static theoretical work on asset fixity, length of run and supply response, suggests that the theoretical reasoning behind regressions I and II is far from adequate or complete.

The Place of Nerlove's Results in the Literature on the Supply of Agricultural Products [4]

It appears that Nerlove's theories, estimating techniques and empirical results will fit into the body of literature on supply responses about as follows:

1. His theories involving coefficients of price expectations and adjustments will persist since they are superior to past theories assuming certain values for these coefficients. As past theories have proved useful despite their shortcomings, Nerlove's concepts should prove still more useful.

2. His theories, however, are likely to prove capable of being improved by making his γ and β functions of variables other than past prices and output.

3. Attempts to make γ and β functions of

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[4] Incidentally, the body of literature on this subject is much larger than that covered in Nerlove's review. Notable for the omission from Nerlove's review are three publications, all dealing with supply and all involved in Farm Economic Association annual awards: (1) Roger W. Gray, Vernon L. Sorenson and Willard W. Cochrane, *An Economic Analysis of the Impact of Goverment Programs on the Potato Industry of the U.S.*, University of Minnesota Technical Bulletin 211, 1954, (2) Dale E. Hathaway, *The Effects of the Price Support Program on the Dry Bean Industry in Michigan*, Michigan State College Technical Bulletin 250, April 1955, and (3) Glenn L. Johnson, *Burley Tobacco Control Programs*, Kentucky Agricultural Experiment Station Bulletin 580, February 1952. Other omitted work includes that of George E. Schuh, *The Supply of Fluid Milk in the Detroit Milkshed as Affected by Cost of Production*, Michigan Agricultural Experiment Station Technical Bulletin 259, April 1957. Schuh reports a short-run elasticity for milk production ranging from 0.41 to 0.57, an estimate which should have been of considerable interest to Nerlove.

additional variables may prove helpful in providing "identification" of β and γ in more advanced models still to be developed.

4. Attempts to improve price expectations and adjustment models beyond levels attained by Nerlove should include attention to:
(a) Current work on dynamics;
(b) current work on asset fixity and length of run and may result in the elimination of β and γ.

5. Despite its name, Nerlove's work will not become known as "*The* Dynamics of Supply." Presently, we do well to say *something* meaningful about supply dynamics.

6. Nerlove's work will prove to be an important step forward in the analysis of supply. He can be proud of it within:
(*a*) His cautious prefatory statement quoted in the beginning of this review, and
(*b*) in view of the following discussion of the use of his estimates which appears on p. 215: "In this section the statistical results presented in the preceding section are applied to a variety of problems. Knowledge about the elasticities of supply is useful in a large number of areas; the problems discussed in this section serve only to illustrate the uses to which such estimates may be put. Three problems are considered: (1) the accuracy of farmer's expectations of 'normal' price taken as a forecast of actual price; (2) the question of whether an equilibrium of demand and supply is stable; and (3) welfare losses under alternative price-support programs. *No definite answers are attempted in the discussion of any of these problems primarily because the results presented in the preceding section are highly tentative.*" (My italics).

This frank, highly commendable statement indicates that Nerlove is a good scientist; it should be pondered as carefully as Nerlove has written it by all who might be inclined to use distributed lags and Nerlove's models for price expectations and production adjustments.

Glenn L. Johnson

Technology in American Water Development. By Edward A. Ackerman and George O. G. Löf, with the assistance of Conrad Seipp. Published for Resources for the Future, Inc., by the Johns Hopkins Press, Baltimore, Md. 709 pages, illustrated. 1959. $10.

ACKERMAN AND LÖF have given us an important work. Its rich content of facts and ideas are like those of a valuable mine or storehouse. Much can be learned by examining the contents, but these are the raw ores that must be shaped into a variety of products that will help in meeting specific water problems.

The authors review proven and emerging water technology with the purpose of classifying techniques and outlining specific technical subjects for more detailed study. Then they seek to appraise the relation between technology and administration of water resources in the United States.

Thirty-one case descriptions selected from proven and emerging technology are presented. These descriptions represent much of the water technology of agriculture, and industry upon which popular and scientific interest has centered. They are grouped under five categories of technology which economists will recognize as involving the discovery of new production functions, a more intensive use of known functions, and application of functions over a wider range.

The five categories are techniques that (1) increase demand for water, (2) decrease demand, (3) extend the services of a given unit of water supply, (4) promote economies of scale, (5) extend the physical range of water recovery.

Demand-increasing technology consists largely of new processes requiring large inputs of water. Of interest here is the discussion of the likely impact of peaceful uses of atomic energy. Demand-decreasing technology includes water-saving innovation through the substitution of capital for water in the production process. Here the account of industrial recycling will be helpful in appraising the future water requirements of industry. Another fertile field for research that is discussed is the technique of spraying the effluent from food-processing plants on agricultural lands for irrigation. Use of saline water and development of drought-resistant crops are further examples given of demand-decreasing technology.

Techniques extending the services of a given supply are modification of water supplies to a desired quality, time and place, and their subsequent allocation to various uses. The promotion of scale economies includes the improvement of machinery and techniques for construction and operation of systems for the collection and distribution of water supplies over a large area.

Most stimulating are the cases described under "Expanding the Physical Range of Water Recovery." This category is closely related to the preceding one and consists of the modification of water in the ocean, in the atmosphere, and in its discovery underground. Estimates of potential increase in precipitation through cloud seeding are given for 11 Western States.

In their consideration of administrative response to technology, the authors explicitly exclude the complex of human values and social forces that ultimately shape administrative organizations and their response to technology in water and elsewhere. Within this limitation, judgments are made of the success of administration in facilitating realization of benefits inherent in technology. The appraisal is in terms of the five categories of technology, cast into planning, development, and operational phases. The responses and potential roles are discussed for private, public, local, State, regional, and national bodies.

The conclusions are manifold, and perhaps it is in the nature of the subject that no easy summary can be given. To those acquainted with reports on water policy prepared by governmental commissions and boards, many of the conclusions will have a familiar ring. Yet something is new, primarily in perspective. There is a persistent emphasis on the role of water administration: the matching of supply and demand for water. The forces that shape the demand for water are evaluated, as is the appropriate geographic area for planning. Water development is viewed in terms of the interaction of other resources, population, and technology. In short, regional rather than project planning is stressed.

Technology in American Water Development will make its most valuable contribution as a

wellspring of ideas and facts that stimulate further research. Those who read the book for clear-cut answers to specific problems are likely to be disappointed. At another level, the book can serve as a comprehensive introduction and survey of the water field. The glossary, and particularly the introductory chapters offer a broad sweep and insight into the patterns of occurrence and use of water. Helpful references appear in a topical reference list and in footnotes throughout the text.

Karl Gertel

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Economics of American Forestry. By Albert C. Worrell. John Wiley and Sons, Inc., New York. 441 pages illus. 1959. $9.75.

THE ECONOMICS of forestry has been taught for a long time in forestry schools in the United States, but for many years there has been no satisfactory text for the use of students in such courses. As a professor of forest economics, now at Yale University, Professor Worrell has undoubtedly been acutely aware of the imbalance between the demand for a textbook and the supply, and has written, in his words, "a text for a college course in the economics of forestry." His objectives were "to give a clear picture of the economic environment within which forestry operates, to help the student in understanding the many economic relationships which exist in forestry and to furnish some tools of analysis which might prove useful in coping with economic problems as they arise in forestry."

In carrying out his objectives the author has devoted about three-fourths of his book to chapters on the consumer demand for forest products, the supply of forest products and services, production economics in forestry, the processing of forest products, the demand for wood as a producer's good, growing and harvesting forest products, capital in forestry production and other related topics. Upon reading this material one gets the impression that it will be useful to small businessmen such as the operators of small sawmills and pulpwood loggers as well as students.

The last quarter of the book is apparently directed to foresters who play a broader role in industry and Government. It includes chapters on the social and private costs and benefits in forestry, unpriced forest products and services, future demand for forest products and services, ownership of forestry enterprises and lands, government and forestry, and economic-policy problems in forestry.

Professor Worrell has taken elementary economic theory and illustrated it with examples from forestry. The text is written in simple language that should be readily understood by forestry students without previous training in economics. His book is therefore likely to be widely used in forestry schools, particularly where the students in forest economics have not received prior training in elementary economic theory.

On the negative side, the general coverage of the book seems to lack balance—too much of the text is devoted to supply-demand analysis of the firm and not enough to the broader economic problems of forestry. For example, scarcely any mention is made of taxation, insurance, and credit. Business cycletheory, which should be of great interest in forestry, is almost completely ignored and the field of macroeconomics is inadequately presented.

It is, of course, easy to pick flaws and say the author should have done this or that; but by any set of standards, Professor Worrell's effort represents a substantial achievement and a major contribution to the field of forest economics.

Dwight Hair

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Economics of the Business Firm. By Joseph D. Coppock. McGraw-Hill Book Company, Inc., New York. 366 pages. 1959. $6.95.

ADAPTATION of relevant elements of standard economic analysis to the needs of business students is the aim of Professor Coppock's textbook. The student is not expected to have had a general course in economics, though this would help. The work is designed for a course of one quarter or one semester.

The nature, aims, and place of the business firm in economic organization and the nature and determinants of profits are covered in part 1. A chapter on "tools" discusses schedules, curves, cost functions, slope, elasticity, shifts, and so on. Part 2 considers the "Mechanisms of Profit Maximization" under different conditions of cost. Part 3 is devoted to "Determinants of Demand for the Firm's Product," covering the demands of consumer-buyers, demands of producer-buyers, demand under different conditions of "market structure" and demand manipulation. Also discussed are methods of estimating demand. Finally, "Determinants of the Cost of the Firm's Products" are dealt with in part 4, covering the technical conditions of production, the prices of inputs (under alternative "market structures") and methods of estimating costs. A short conclusion considers the applicability of the economics presented. A summary is given at the end of each chapter and each section. Questions and supplemental readings are appended.

The arrangement of subject-matter is evidently somewhat distinctive, and this commends the work to the attention of teachers. The text is readable, diagrammatic, and nonmathematical. One may wish for more liberal use of illustrations to dramatize analysis. But this would be asking Professor Coppock to write a bigger book or to delete subject matter. The latter point suggests the larger question, what subjects are important for the business student or others seeking an understanding of the economics of the business firm? For example, there is more to the economics of the business firm than cost and revenue analysis under nine alternative market structures as developed in chapters 15 and 21. Yet it may be better to drill the student on these methods of analysis, than to broaden his exposure to economics.

A few substantive comments will suffice. Included in the cost of production is the opportunity cost of capital employed. Few businessmen can afford to lose sight of this realism. But this reviewer has misgivings about the wisdom of holding money used in business as a producer or capital good (pages 44–45, 304–305). Similarly, it seems unfortunate to perpetuate the notion that production creates possession utilities (page 44), or to view the economic role of households as narrowly as discussion of the applicability of the money calculus shows (pages 22–24). Such concepts are not necessary for marginal analysis of the business unit as Professor Coppock has developed it.

Allen B. Paul

The Computer and the Brain. By John von Neumann. Yale University Press, New Haven. 82 pages. 1958. $3.00.

A COMPUTER is an often-maligned piece of machinery. All kinds of exaggerated claims are asserted about its prowess. Not the least of such claims infers that a computer thinks for itself. If it does, then obviously the line of demarcation between machine and man fades.

In this short book, which presents the 1956 Silliman Lectures at Yale University, the late John von Neumann compares computing machines with the human brain. Sadly, his wife Klara reminds the reader that these lectures represent an "unfinished and fragmentary manuscript." The burden of a fatal illness was too much for even the exceptional mind of a von Neumann to surmount in his final days.

Through a discussion of some of the principles

underlying the systematics and the practice of computing machines, as well as a discussion of the human nervous system, von Neumann brings out their similarities and dissimilarities. By such means he hoped to learn how an approach toward the understanding of the nervous system ought to be made from the mathematician's point of view.

Computing machines are basically of two types: "analog" and "digital," though there are machines that embody the principles of both types. Analog computers represent each number by a physical quantity, such as the angle by which a disk has rotated or the strength of a current. Digital computers designate each number as a sequence of digits. Each digit is identified by the presence or absence of a marker, which may be in the form of a magnetized spot.

How the two basic types of computers perform the conventional basic operations of arithmetic is described in part 1. Once a procedure is established by which a computer can perform these operations, the machine must then be made to perform them according to a sequence that produces the solution of a mathematical problem. The necessity to "sequence" operations has as a consequence the need for a "memory."

The machine's memory, von Neumann points out, "must be able to 'store' a number—removing the one it may have stored previously—accepting it from some other organ to which it is at the time connected, and to 'repeat' it upon questioning: to emit it to some other organ to which it is at that (other) time connected. Such an organ is called a 'memory register,' the totality of these organs is called a 'memory,' and the number of registers in a memory is the 'capacity' of that memory."

Proceeding into part 2, the lectures discuss the human nervous system, comparing it with modern computing machines.

The brain and spinal cord together constitute the central nervous system. The basic component of the human nervous system is the nerve cell, the neuron. The neuron's function is to receive impulses and convey them to other cells. It does this by means of branches called axons and dendrons (also called dendrites). The former normally carries impulses away from the cell body while the latter carries impulses toward the cell body. The point at which the axon of one neuron and the dendrite of another seem to meet is known as the synapse. At this junction the nerve impulse jumps a tiny gap from the axon to the dendrite.

The nervous system, therefore, acts as an organ which accepts and transmits definite physical entities, the pulses. Von Neumann points out that this is the description of the functioning of an organ in a digital machine and justifies the assertion that the nervous system has a digital character.

While these lectures are not easy reading they are worthwhile for anyone who derives enjoyment from the synthesis of disciplines—constituting, in the pages of this volume, mathematics, engineering, and neurology.

Martin J. Gerra

Economic Plan and Action. By Charlton Ogburn. Harper & Brothers, New York. 287 pages. 1959. $4.75.

THE NATIONAL Planning Association, a private nonprofit organization composed of leaders of agriculture, businessmen, and labor, has made an important contribution since 1945 to the development of public and private economic policies. The author was associated with NPA for 15 years as legal counsel. His stated objective in writing this book was to summarize in one publication, with a minimum of supplementary comments, the large number of general and special studies conducted by NPA in the postwar period.

Comments in each chapter, with one exception, cover NPA reports. A number of broad economic problem areas are included, such as the Federal budget and the Full Employment Act. Most of the chapters, however, are concerned with specific problem areas, such as the export of U.S. private capital, foreign aid programs, labor and collective bargaining, and productive uses of nuclear energy and education. In each chapter, some background material on why the study was undertaken by NPA is included, along with the major findings and recommendations.

One difficulty in reading the book arises from its basic organization around the titles of NPA reports which are not tied into other studies on related subjects summarized in different parts of the book. For example, the chapters dealing with the Full Employment Act, the Federal budget, agricultural surpluses, and national defense are closely related to Federal Government budgetary policies, and these NPA reports should be analyzed as a unit if the significance of NPA contribution is to be fully realized by the reader. Findings on problems such as the export of capital, foreign aid, and business performance abroad are scattered throughout the book.

Some of the recommendations are outdated because conditions have changed since the reports were prepared. The importance of price level stabilization as a policy objective, for example, receives less emphasis here than it has in other recent discussions. Finally, the title implies that the book represents more of a direct public and private economic plan of action to achieve stated social goals than is indicated in the contents. Those economists and statisticians who are interested in a summary review of the important studies made by NPA will find this book very useful. However, prospective readers who are looking for a systematic analysis and evaluation of developments of private and Government policy formulation in the postwar period will be disappointed.

Daniel W. Burch

The Study of Economic Growth: Thirty-Ninth Annual Report of the National Bureau of Economic Research. Introduction by Solomon Fabricant. 91 pages. May 1959.

FINDING A CENTRAL THEME for the diverse research enterprises of that amazing and unique institution, the National Bureau of Economic Research, has always been difficult. Dr. Fabricant's choice around which to weave the Bureau's report of current and projected work is the study of economic growth. This fits particularly well certain areas of the Bureau's present activity, such as a historical study of the nature and rate of U.S. growth before 1870, and an over-the-shoulder appraisal of how fast the Soviet Union is now growing.

The growth idea is a less appropriate label for that part of the Bureau's program which still falls in a traditional path, and which results in rediscovery of old truths or in unrelieved frustration as often as it does in unearthing new pieces of economic knowledge. Search for natural periodicity—the pendulum principle—in economic affairs still goes on. Abramovitz, for example, finds substantiating evidence for "the notion that economic growth moves in recurrent waves of acceleration and retardation with a period of between 15 and 20 years."[1] His wondering if these are "systematic" or "episodic" is of a pattern with business-cycle research of the last half-century. Also, his "four basic chronologies—output, stock of resources, productivity, and intensity of resource utilization"—are not novel to farm economists familiar with the cattle cycle.

It is good to see that such studies, reminiscent of Mitchell, while doubtless worthwhile are overshadowed by more modern approaches. Unfortunately, some of the Bureau's growth studies bog down in the problem of identifying and measuring technology separate from capital, one made more complex by the fact that technology is an abstraction while capital is increasingly not measurable by its mass or its price but by its productivity alone. A few of the Bureau's observations on this are unconvincing. Highly gratifying is the Bureau's recognition of the human element in economic matters. Man himself is an integral part of economic society. The Bureau is studying population increase rates, consumers' buying plans, and the great field of "capital investment in human beings." Impressive, and perhaps novel for that staid agency, is an admission with respect to political action: "political decisions . . . induced by the stresses or imbalances . . . in . . . (cycli-

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[1] Perhaps it is not untimely to observe that according to this life expectancy the current acceleration has only a dozen or so months to go.

cal) swings" have a "lasting import." In simpler words, public programs generated by a business recession can make a contribution to long-run growth.

The report omitted only one timely observa-tion, that increased concern with economic growth is itself an expression of the currently existing phase of the business cycle; it is a mark of prosperity.

Harold F. Breimyer

Selected Recent Research Publications in Agricultural Economics Issued by the United States Department of Agriculture and Cooperatively by the State Colleges [1]

ANDREW, RICHARD A. A STUDY OF THE SWEET CORN INDUSTRY IN THE MIDWEST FARM ECONOMY. Minn. Agr. Expt. Sta. Tech. Bul. 232 (No. Cent. Reg. Pub. 95) 116 pp., illus. June 1959.

Presents information on economic relationships and historical developments in the sweet corn industry for the Midwest and the United States. Describes produc-tion and consumption trends, the position of sweet corn in the current setting, and the role of processors in the industry; and analyzes the demand, the Midwest supply for processing, and the competition of the Midwest with other regions.

ATKINS, S W. CHANGING SIZE OF FARMS IN TEN-NESSEE. Tenn Agr. Expt. Sta. Bul. 229, 15 pp., illus. August 1959. (U.S. Agr. Res. Serv. cooperating.)

From a low in the midthirties of 70 acres per farm, the average size of Tennessee farms had grown to 86 acres by 1954. At the same time, average production increased 75 percent, beef and dairy farms having the greatest increase. Among tenure groups, part owners led in expanding the acreage of their farms. Outside forces, mainly nonfarm employment, contributed to the trend by drawing a fourth of the farm operators, chiefly from the tenant group, away from farming.

BERTRAND, ALVIN L., AND OSBORNE, HAROLD W. RURAL INDUSTRIALIZATION IN A LOUISIANA COM-MUNITY. Louisiana State Univ. and Agr. and Mechanical Col. Bul. 524, 40 pp., illus. June 1959. (Agr. Mktg. Serv. cooperating.)

Low-income rural areas are a potential source of employees for industry. Mostly, these employees will be unskilled, young, and willing to work for relatively low wages. Many will not travel out of their commu-nities for outside employment unless it is necessary. Certain types of industrialization can represent a way to raise personal income and levels of living in low-income rural communities.

BRIGHT, I. DIFFERENTIALS IN WORKERS' EARNINGS IN SELECTED SEGMENTS OF FOOD MARKETING. U.S. Dept. Agr., Agr. Mktg. Serv. AMS–333, 15 pp., illus. September 1959.

Describes regional differences in hourly earnings of workers in certain segments of the food marketing in-dustry. Hourly rates compared for the Northeast,

[1] State publications may be obtained from the issuing agencies of the respective States.

South, West, and North Central regions. Comparisons also made of rates in food processing, wholesaling, and other parts of the industry. The study was made to provide a foundation for future work on costs of marketing.

CABLE, C. CURTIS, JR., METCALF, ALONZO, AND OTHERS. USE OF COTTON FIBER TESTS BY UNITED STATES COTTON SHIPPERS. So. Coop. Series Bul. 62, 32 pp., illus. June 1959. (Agr. Expt. Stas. of Ala., Ariz., Ark., Ga., La., Miss., Mo., N. Mex., N.C., S.C., Tenn., and Tex. and Agr. Mktg. Serv. cooperating.)

Objectives of the study were to determine (1) nature and extent of use of measures of differences in fiber fine-ness, fiber strength, and other fiber properties in buying and selling 1956–57 cotton by shippers, (2) influences of these measurements on prices paid and received, and (3) estimated costs of fiber tests to shippers. Data pertinent to these objectives were obtained from 164 shippers in the 13 major cotton-producing States.

CAPEL, GEORGE L. COMPARATIVE COSTS OF ALTER-NATIVE METHODS FOR PERFORMING CERTAIN HANDLING OPERATIONS IN FLORIDA CITRUS PACK-INGHOUSES. Fla. Agr. Expt. Sta. Bul. 609, 69 pp., illus. June 1959. (Agr. Mktg. Serv. cooperating.)

Purposes of study were to measure the physical input-output relationships in specific packinghouse operations and to use these relationships to show relative costs of alternative work methods under a range of output rates.

CLARKE, JAMES H., MYERS, MARDY, AND HUNTER, J. SCOTT. MILK VENDING—A MARKET-WIDE EVALUATION IN BERKELEY COUNTY, W. VA. W. Va. Agr. Expt. Sta. Bul. 429, 58 pp., illus. June 1959. (Agr. Mktg. Serv. cooperating.)

Sales of fluid milk through coin-operated vending machines averaged 1.5 percent of total milk sales in the market area from October 1955 to June 1957. More than 70 percent of milk vended was sold in plants and offices. Before installation of vending machines in these plants and offices, 19 percent of the employees used milk; after installation 63 percent used milk.

DIETRICH, R. A. AND WILLIAMS, W. F. MEAT DISTRIBUTION IN LOS ANGELES AREA. U.S. D.A. Mktg. Res. Rept. 347, 84 pp., illus., July 1959.